

REMARKS

This Amendment is in response to the Office Action of July 11, 2006 in which claims 1-37 were rejected. With this Amendment, claims 1, 5, 7, 9, 13, 19, 21, 25, 30, and 33-36 are amended. Claims 1-37 remain in the application and are presented for reconsideration and allowance.

Entry and favorable consideration of the amendments and remarks presented herewith is earnestly solicited.

I. Rejections under 35 USC §112

In the Office Action, claims 7 and 19 stand rejected under 35 USC § 112, second paragraph, as being indefinite. With this Amendment, dependent claims 7 and 19 have been amended to clarify that "packet size" relates to the packet size of message packets to be transmitted by telemetry. With the amendment to claim 7 and 19, the rejection under 35 USC § 112 has been overcome, and should be withdrawn.

II. Rejections under 35 USC §102

Claims 1-27, 29-32 and 34-37 stand rejected under 35 USC § 102(e) as being anticipated by Weisner et al. (U.S. Patent Publication No. 2003/0167078). In addition, claims 28 and 33 were also rejected under 35 USC § 102(e) as being anticipated by or in the alternative under 35 USC 103(a) as obvious over Weisner et al. With this Amendment, each of the independent claims 1, 9, 13, 21, 25, 30, and 34-36 has been amended to clarify the difference between the present invention and the device and system described in Weisner.

Weisner describes an implantable medical device which is capable of being programmed or selectively paused or stopped using a magnet that is held close to the location of the implantable medical device (IMD). Weisner's IMD includes a magnetic sensor that senses the presence of the magnetic field from the programming device.

In col. 1, paragraph 3, Weisner recognizes that one potential problem with the use of a magnetic sensor for programming; pausing or stopping operation of an IMD can be the presence of an unexpectedly large magnetic field can result from operation of an MRI device.

It is also valuable to be able to selectively pause/stop the operation of such an implanted device, e.g., see U.S. Pat. No. 6,101,417 to Vogel et al. which describes the capability to protect the operation [of] an implanted device from being evoked by an unexpectedly large magnetic field, e.g., resulting from an MRI device. The present invention improves upon such a capability by using an interlocking magnetic device, e.g., an electromagnet, that generates a string of magnetic pulses to evoke (or suppress) a response in the implantable device. By distinguishing the amplitude/duration/sequence of magnetic pulses, implanted devices can be selectively activated or deactivated.

Weisner addresses this issue by a magnetic programmer such as programmers 187a-187d shown in FIGS. 13, 14, 16A and 16B, respectively. Each of these programmers can be used to produce a defined sequence of magnetic pulses, which can include alterations in magnitude and polarity of the pulses. The IMD is responsive to that particular sequence of magnetic pulses so that it can be enabled or disabled. As a result, a stray magnetic field, such as one produced by an MRI device, will be sensed by the magnetic sensor of the IMD, but will not be recognized or acted on because it does not have the particular sequence of magnetic pulses required to selectively enable or disable the IMD. Paragraph 0074 on page 11 of Weisner describes the use of a particular sequence of magnetic pulses generated by a programmer to enable or disable the IMD, and how that avoids an erroneous emergency shutdown caused by a stray magnetic field from an MRI device.

The present invention is concerned with a very different problem. It is desirable to allow an IMD with telemetry capability to continue to communicate while the patient is undergoing an MRI examination. However, the MRI device operates by applying a very strong static magnetic field, together with gradient fields, and then applies bursts of electromagnetic radiation, which are typically in

the radio frequency (RF) spectrum. These radiation bursts, as well as the gradient fields, can interfere with RF telemetry that is being used by the IMD to communicate by telemetry with other devices.

The present invention addresses this problem by coordinating the operation of the telemetry of the IMD with operation of the MRI device. The IMD either receives or identifies information regarding MRI electromagnetic radiation bursts being applied to a patient, and then adjusts the telemetry of the IMD during a period when the bursts are being applied to the patient. With this adjustment to the telemetry, the IMD is capable of communicating by telemetry during the period when the bursts are being applied. The present application describes a number of different ways in which the adjustment can be made. For example, operation of telemetry of the IMD can be synchronized so that telemetry only occurs between burst intervals of the MRI electromagnetic radiation bursts. The telemetry of the IMD can be blanked or disabled while an MRI electromagnetic burst is being applied, and then enabled to communicate during the time interval between burst intervals. In another embodiment, telemetry power is increased during burst intervals. This allows telemetry to continue during burst intervals, as well as between burst intervals.

Other adjustments may include changing the packet size of message packages sent so that messages are the length that they will be transmitted completely during the time interval between blanking periods. And still another embodiment, an alternative form of telemetry, such as the use of sound waves, can be selectively used during the time period when electromagnetic radiation bursts are being applied to the patient.

Each of the independent claims have been amended to clarify that telemetry of a medical device is adjusted during a period when MRI electromagnetic radiation bursts are being applied (or are occurring) so that the medical device can communicate by telemetry during the period when the MRI electromagnetic radiation bursts are being applied or are occurring. This feature of the present invention is neither taught nor suggested by Weisner. As a result,

independent claims 1, 9, 13, 21, 25, 30, and 34-36 define an invention which is neither taught nor suggested by Weisner, and should be allowed. Similarly, the dependent claims which depend from the independent claims for the same reasons. The rejection of claims 1-27, 29-32 and 34-37 under 35 USC § 102(e) based on Weisner, and the rejection of claims 28 and 33 under either 35 USC § 102(e) or 35 USC § 103(a) over Weisner should be withdrawn.

III. Conclusion

In conclusion, this Amendment places the application in condition for allowance. Notice to that effect is requested. Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned attorney to attend to these matters. The Commissioner is authorized to charge any deficiencies and credit any overpayments to Deposit Account No. 13-2546.

Respectfully submitted,

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